Small Business Innovation Research/Small Business Tech Transfer

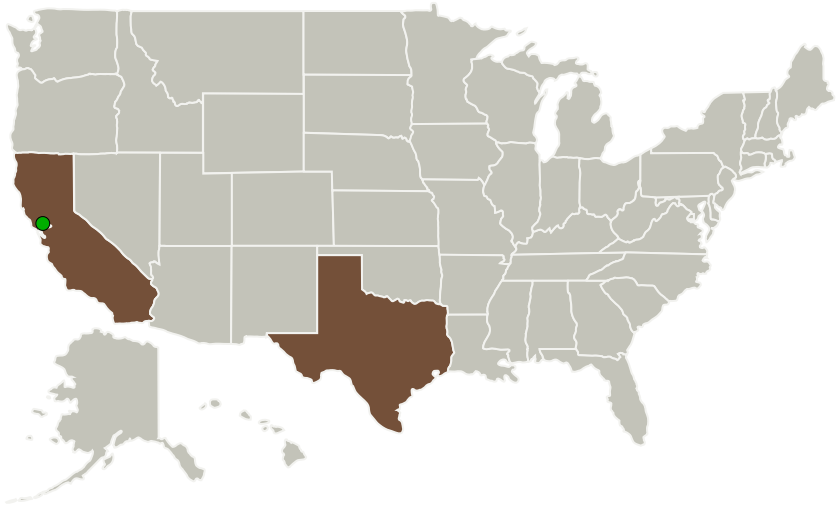
Ontological Models to Support Planning Operations, Phase II

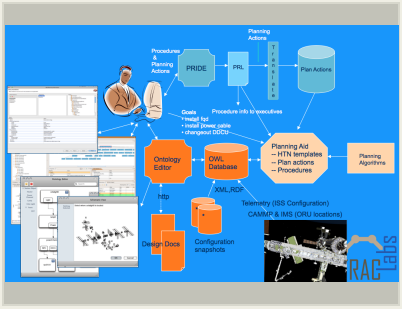
Completed Technology Project (2012 - 2014)

Project Introduction

Automation and autonomy technologies, such as automated planning software, are key elements in realizing the vision for space exploration. However, the major stumbling block to realizing the widespread use of automation tools for operations is capturing and maintaining the domain models -- the object types and subtypes, relationships among them and operational constraints -- needed to support such techniques. Our success in Phase 1 showed that it is possible for subject matter experts (SMEs) to author ISS model information to produce a consistent model useful for planning, scheduling and procedure execution. In this Phase 2 proposal we aim to fully develop the authoring and data integration portions of our design and to integrate the resulting models with our interactive planning aid for flight controllers. The benefits for NASA operations are that the resulting modeling framework will 1) make available a consistent domain model that need not be reproduced for each automation project, unify the often disparate sources of EVA and Core Systems information, provide for rapid update of ISS configuration information, thus allowing automation applications to provide results based on the most recent data, provide a consistent view of the domain so as to minimize error in authoring procedural data.

Primary U.S. Work Locations and Key Partners





Ontological Models to Support Planning Operations

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Organizations Performing Work	Role	Type	Location
TRACLabs, Inc.	Lead Organization	Industry	Webster, Texas
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

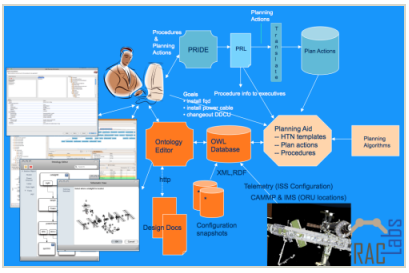
April 2012: Project Start

April 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138388)*

Images



Project Image
Ontological Models to Support Planning Operations
(https://techport.nasa.gov/image/130800)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
TRACLabs, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Russell Bonasso

Co-Investigator:
Russell Bonasso

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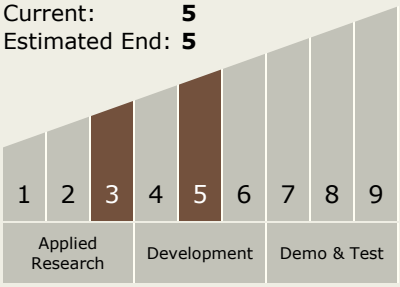
Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.4 Execution and Control

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System